

616 Table S1. List of primers used in this study

Primer	Sequence (5' to 3')	Template	Plasmid
HT01_TBGF	ACCATGATTACGCCAAGCTTATGA ATGTGTTATCCTCAAT	pDL	pHT01
HT01_TBGR	AACCAGCCAGCCCGAGAATTCCTA AACCTTCCCGGCTTCA		
HT01_BBF	GAATTCTCGGGCTGGCTGGT	pNW33N	
HT01_BBR	AAGCTTGGCGTAATCATGGTCAT		
HT79_kivdF	AATAAGAAGGGAGAATAGTGATG TATACAGTAGGAGATTA	pSA65	HT79
HT79_kivdR	TTATGATTTATTTTGTTTCTAG	pSA65	
HT79_BBF	CTGAACAAAATAAATCATAAGAAT TCTCGGGCTGGCTGGT	pHT01	
HT79_BBR	CACTATTCTCCCTTCTTATTATTG	pHT01	
	AAATAAATCATAATAAGGAGGAA		
HT13_AlsF	CTACTTTGACAAAAGCAACAAAAG AACAAAAATCCC TCAGCAATAAACCAGCCAGCCCG	pSA69	HT13
HT13_AlsR	AGAATTCTTAGAGAGCTTTCGTTT TCATGAGTTCC	pSA69	
HT13_BBF	GAATTCTCGGGCTGGCTGGT	HT79	

	CTTTTGTCAAAGTAGTTCCTCCTTA		
HT13_BBR	TTATGATTTATTTTGTTTCAGCAAAT	HT79	
	AGTTTGCCC		
HT71_ilvCF	CATAATAAGGAGGAACTACTATG	<i>G. thermoglucosidasius</i>	HT71
	GCAAAAGTTTACTATAACGG		
HT71_ilvCR	TGCTTTTGTCAAAGTAGTTCCTCCT		
	TATTAATTTTCTCACTCGTAACC		
HT71_BBF	GAAGTACTTTGACAAAAGCA	HT13	
HT71_BBR	AGTAGTTCCTCCTTATTATG		
HT77_ilvDF	CCGTTCCCAATTCCACATTGCA	<i>G. thermoglucosidasius</i>	HT77
HT77_ilvDR	TAAGGAGGAACTACTATGTTGGG		
	AAAACCTTCGCAG		
HT77_BBF	TGCAATGTGGAATTGGGAACGG	HT71	
HT77_BBR	AGTAGTTCCTCCTTATTAATTTTTC		
	TCACTCGTAA		
HT112_AdhF	TAAGGAGGAACTACTATGAAAGC	<i>G. thermoglucosidasius</i>	HT112
	ACTTACATACCTAGGG		
HT112_AdhF	CCAGCCCGAGAATTCTTAACTGTT		
	GGAAATAATGACTTTTAACG		
HT112_BBF	CACCACCACCACCACCTG	pET-26b (+)	
HT112_BBR	CGGATCCGAATTAATTCCGATATC		
	CATGGC		

HT133_ilvCF	TAAGGAGGAACTACTATGGAGAA AATTTATTACGACGC	<i>A. acidocaldarius</i>	HT71
HT133_ilvCR	CAAAGTAGTTCCTCCTTATTAAGC CCGATCCGCGGTGG		
HT133_BBF	GTCGTAATAAATTTTCTCCATAGT AGTTCCTCCTTATTATGATTTATTT TGTTCAAGCAA	HT71	
HT133_BBR	TAAGGAGGAACTACTTTGACAAA AGCAACAAAAGAACA		
HT134_ilvCF	TAAGGAGGAACTACTATGGTAAA AGTATATTACAATGGCGA	<i>A. flavithermus</i>	HT71
HT134_ilvCR	CAAAGTAGTTCCTCCTTATTAATTT TTCGCACCGACCGT		
HT134_BBF	ATTGTAATATACTTTTACCATAGTA GTTTCCTCCTTATTATGATTTATTTT GTTCAAGCAA	HT71	
HT134_BBR	TAAGGAGGAACTACTTTGACAAA AGCAACAAAAGAACA		
	AATTCGGATCCGCACCACCACCAC		
HT194_AlsF	CACCACATGAAACAGACCATCCGC AATATCAGC	<i>G. thermoglucosidasius</i>	HT194
HT194_AlsR	CTTTCGGGCTTTGTTAGCAGCCGG		

	ATCTCACCGAGAATTCGAGCGCTT		
	TCG		
HT194_BBF	TGAGATCCGGCTGCTAACAAAGC	pET-26b (+)	
HT194_BBR	GTGGTGGTGGTGGTGGTGC		
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	AATTCGGATCCGCACCACCACCAC		
HT195_AlsF	CACCACATGGGAGGGACGGCCAT	<i>G.thermodenitrificans</i>	HT195
	G		
	CTTTCGGGCTTTGTTAGCAGCCGG		
HT195_AlsR	ATCTCATCATCTGTCTGACAGTCTC		
	ATCGTCA		
HT195_BBF	TGAGATCCGGCTGCTAACAAAGC	pET-26b (+)	
HT195_BBR	GTGGTGGTGGTGGTGGTGC		
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	TCGGATCCGCACCACCACCACCAC		
HT196_AlsF	CACGTGTTTCATGTCAGAAGAAAA	<i>S. thermophilus</i>	HT196
	GCAATTGTATGG		
	TTCGGGCTTTGTTAGCAGCCGGAT		
HT196_AlsR	CTCAGTAAAATTCATCTGGCAAAA		
	TAGTTTCGCCG		
HT196_BBF	TGAGATCCGGCTGCTAACAAAGC	pET-26b (+)	
HT196_BBR	GTGGTGGTGGTGGTGGTGC		
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HT208_AdhF	CCGTTCCCAATTCACATTGCA	HT112	HT208
HT208_AdhR	TAAGGAGGAACTACTATGAAAGC		

	ACTTACATACCTAGGG		
HT208_BBF	TGCAATGTGGAATTGGGAACGG	HT71	
HT208_BBR	TTCATAGTAGTTCCTCCTTATTAGA GAGCTTTCGTTTTCA		
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	AGTGAGAAAAATTAATAAGGAGG		
HT209_AIsF	AACTACTGTGTTTCATGTCAGAAGA	HT196	HT209
	AAAGCAATTGT		
	CAGCAATAAACCAGCCAGCCCGA		
HT209_AIsR	GAATTCGTAAAATTCATCTGGCAA		
	AATAGTTTCGCC		
HT209_BBF	GAATTCTCGGGCTGGCTGGT	HT71	
HT209_BBR	AGTAGTTCCTCCTTATTAATTTTC TCACTCGTAA		
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KSR124_UP	GATATACATATGCACCACCACCAC CACCACGGAGGGACGGCCATG	<i>G.thermodenitrificans</i>	KSR124
KSR124_DN	CTTTGTTAGCAGCCGGATCTCATC ATCTGTCTGACAGTCTCATCG		
KSR123_UP	TGAGATCCGGCTGCTAACAAAG	pET-22b (+)	
	GTGGTGGTGGTGGTGGTGCATAT		
KSR123_DN	GTATATCTCCTTCTTAAAGTTAAAC AAAATTATTTTC		
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KSR238-UP	TTAACTTTAAGAAGGAGATATACA		KSR238

	TATGTATACAGTAGGAGATTACCT	
	ATTAGACCG	
	GGGCTTTGTTAGCAGCCGGATCTC	
KSR238-DN	AGTGGTGGTGGTGGTGGTGTGAT	<i>L. lactis</i>
	TTATTTTGTTTCAGCAAATAGTTTGC	
	CC	
KSR201_UP	TGAGATCCGGCTGCTAACAAAGC	pET-22b (+)
KSR201_DN	ATGTATATCTCCTTCTTAAAGTTAA	
	ACAAAATTATTTCTAGAGGGG	

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618 Table S2. K_{cat} activity of purified putative decarboxylases from thermophiles.

Organism	Gene locus	His-tag location	K _{cat} (s ⁻¹)
<i>G. thermoglucosidasius</i>	Geoth_3495	N- terminus	1.1
<i>G. thermodenitrificans</i>	Gtng_0348	N- terminus	0.4
	Gtng_0651	N- terminus	0.1
	Gtng_1810	C- terminus	ND
	Gtng_1891	C- terminus	ND

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